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10/064,471	07/17/2002	Jeffrey Rahn	107153	7900
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OLIFF & BERRIDGE, PLC.			HO, ALLEN C	
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ALEXANDRIA, VA 22320			2882	

DATE MAILED: 04/01/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/064,471

Applicant(s)

RAHN, JEFFREY

Examiner

Allen C. Ho

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 17 July 2002.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-17 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-17 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 17 July 2002 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Specification

1. The disclosure is objected to because of the following informalities:
 - (1) Paragraph [0031], line 2, "600" should be replaced by --100--.
 - (2) Paragraph [0033], line 6, --U. S. Patent No. 6,408,054-- should be inserted after "09/444,704".
 - (3) Paragraph [0033], lines 7-9 should be rewritten.
 - (4) It is not clear to which diode this refers in the following places: paragraph [0038], line 12; paragraph [0044], line 10; paragraph [0048], line 10; paragraph [0049], line 11; paragraph [0050], lines 3 and 6.
 - (5) Paragraph [0049], lines 3, 8, and 11, "655" should be replaced by --652--.

Appropriate correction is required.

Drawings

2. The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the third and fourth capacitors as claims in claims 4, 5, and 8-11 must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.
3. The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the subject matters claimed in claims

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8-11 must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

Claim Objections

4. Claim 1 is objected to because of the following informalities: Claim 1 recites the limitations "the first capacitor" and "the second capacitor". There is insufficient antecedent basis for this limitation in the claim. Appropriate correction is required.

5. Claim 2 is objected to because of the following informalities: line 1, "device" should be deleted. Appropriate correction is required.

6. Claim 4 is objected to because of the following informalities: line 2, "device" should be deleted. Appropriate correction is required.

7. Claim 6 is objected to because of the following informalities: line 2, "source" should be replaced by --beam--. Appropriate correction is required.

8. Claim 12 is objected to because of the following informalities: Claim 12 recites the limitations "the first capacitor". There is insufficient antecedent basis for this limitation in the claim. Appropriate correction is required.

9. Claim 13 is objected to because of the following informalities:

(1) Line 3, "the" in front of "one" should be deleted.

(2) Line 5, "the" after "and" should be deleted.

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Appropriate correction is required.

10. Claim 14 is objected to because of the following informalities: --beam-- should be inserted after "x-ray--". Appropriate correction is required.

11. Claim 17 is objected to because of the following informalities: line 11, "the" in front of "phase" should be replaced by --beam--. Appropriate correction is required.

Claim Rejections - 35 USC § 112

12. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

13. Claims 1-17 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claims 1, 12, and 17 recite "an input device that includes a sensor". It is unclear if this sensor refers to the two-dimensional array of pixels or some other sensor.

Claim Rejections - 35 USC § 102

14. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

15. Claims 1-3, 12, 13 are rejected under 35 U.S.C. 102(b) as being anticipated by Fossum *et al.* (U. S. Patent No. 5,841,126).

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With regard to claim 1, Fossum *et al.* disclosed an imaging system, comprising: a two-dimensional array of pixels (300); an input device that includes a sensor (300) that provides an electronic signal; a controller (302); the electronic signal controlled by the controller (by turning transistors 116 and 120 on and off) so that the electronic signal is either stored in a first capacitor (114), or is stored in a second capacitor (118).

With regard to claim 2, Fossum *et al.* disclosed the imaging system according to claim 1, the two-dimensional array of pixels further comprising: a plurality of transistors (116, 120) and at least two control signals (Figs. 4A, 4B), one of the at least two control signals controlling one (116) of the plurality of transistors so that the electrical signal is stored in the first capacitor (114), and the other one of the at least two control signals controlling another one (120) of the plurality of transistors so that the electronic signal is stored in the second capacitor (118).

With regard to claim 3, it fails to set forth further structural limitations. Accordingly, it is rejected with claim 2.

With regard to claim 12, Fossum *et al.* disclosed an imaging system, comprising: a two-dimensional array of pixels (300); an input device that includes a sensor (300) that provides an electronic signal; a controller (302) that provides control signals (by turning transistors 116 and 120 on and off); the electronic signal controlled by the controller so that the electronic signal is either stored in a first capacitor (114) during a phase of one of the control signals, or not stored in the first capacitor during a phase of another one of the control signals.

With regard to claim 13, Fossum *et al.* disclosed the imaging system according to claim 12, the two-dimensional array of pixels further comprising: a plurality of transistors (116, 120) one of the control signals controlling one of the plurality of transistors so that the electronic

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signal is stored in the first capacitor (114) during the phase of the one of the control signals, and another one of the control signals controlling another one of the plurality of transistors so that the electronic signal is not stored in the first capacitor during the second phase of another one of the control signals.

With regard to claim 16, it fails to set forth further structural limitations. Accordingly, it is rejected with claim 13.

16. Claims 1-5, 8, 12, 13, and 15 are rejected under 35 U.S.C. 102(b) as being anticipated by Chen *et al.* (U. S. Patent No. 5,901,257).

With regard to claim 1, Chen *et al.* disclosed an imaging system, comprising: a two-dimensional array of pixels (101); an input device that includes a sensor (101) that provides an electronic signal; a controller (319); the electronic signal controlled by the controller so that the electronic signal is either stored in a first capacitor (C1), or is stored in a second capacitor (C3).

With regard to claim 2, Chen *et al.* disclosed the imaging system according to claim 1, the two-dimensional array of pixels further comprising: a plurality of transistors (four transistors before C1, C2, C3, C4) and at least two control signals (SW1, SW2), one (SW1) of the at least two control signals controlling one (before C1) of the plurality of transistors so that the electrical signal is stored in the first capacitor (C1), and the other one (SW2) of the at least two control signals controlling another one (before C3) of the plurality of transistors so that the electronic signal is stored in the second capacitor (C3).

With regard to claim 3, it fails to set forth further structural limitations. Accordingly, it is rejected with claim 2.

With regard to claim 4, Chen *et al.* disclosed the imaging system according to claim 2, the two-dimensional array of pixels further comprising a third (C2) and a fourth (C4) capacitor connected to the sensor.

With regard to claim 5, Chen *et al.* disclosed the imaging system according to claim 4, the two-dimensional array of pixels further comprising: a plurality of control signals (Fig. 3), one (SW1) of the at least plurality of control signals controlling a third (before C2) one of the plurality of transistors so that the electronic signal is stored in the third capacitor (C2), and at least another one (SW2) of the plurality of control signals controlling a fourth one (before C4) of the plurality of transistors so that the electronic signal is stored in the fourth capacitor (C4).

With regard to claim 8, Chen *et al.* disclosed the imaging system according to claim 4, further comprising a plurality of transmitters (This is inherent since an imaging system is designed to detect optical images transmitted from transmitters).

With regard to claim 12, Chen *et al.* disclosed an imaging system comprising: a two-dimensional array of pixels (101); an input device that includes a sensor (101) that provides an electronic signal that represents an image to the two-dimensional array of pixels; a controller (319) that provides control signals; the electronic signal controlled by the controller so that the electronic signal is either stored in a first capacitor (C1) during a phase of one (SW1) of the control signals, or not stored in the first capacitor during a phase of another one (SW2) of the control signals.

With regard to claim 13, Chen *et al.* disclosed the imaging system according to claim 12, the two-dimensional array of pixels further comprising: a plurality of transistor (four transistors before C1, C2, C3, C4), one (SW1) of the control signals controlling one (before C1) of the

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plurality of transistors so that the electronic signal is stored in the first capacitor (C1) during a phase of one of the control signals, and another one (SW2) of the control signals controlling another one (before C3) of the plurality of transistors so that the electronic signal is not stored in the first capacitor during a second phase of another one of the control signals.

With regard to claim 15, Chen *et al.* disclosed the imaging system according to claim 13, further comprising the controller controlling the electronic signal based on color features within the electronic signal so that one color of the electronic signal is stored in the first capacitor, and another color of the electronic signal is not stored in the first capacitor (color separation).

Claim Rejections - 35 USC § 103

17. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

18. Claims 4 and 8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fossum *et al.* (U. S. Patent No. 5,841,126) as applied to claim 2 above, further in view of Cannata *et al.* (U. S. Patent No. 5,811,808).

With regard to claim 4, Fossum *et al.* disclosed the imaging system according to claim 2. However, Fossum *et al.* failed to teach that the two-dimensional array of pixels further comprises a third and a fourth capacitor connected to the sensor.

Cannata *et al.* disclosed an offset correction circuit (220) for a two-dimensional array of pixels (100) that comprises a plurality of capacitors (224) in an offset correction circuit.

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It would have been obvious to a person of ordinary skill in the art at the time the invention was made to provide additional capacitors in an offset correction circuit, since a person would be motivated to reduce noise in the signals.

With regard to claim 8, Fossum *et al.* in combination with Cannata *et al.* disclosed the imaging system according to claim 4, further comprising a plurality of transmitters (This is inherent since an imaging system is designed to detect optical images transmitted from transmitters).

19. Claims 6, 7, and 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fossum *et al.* (U. S. Patent No. 5,841,126) as applied to claims 3 and 12 above, and further in view of Fossum (U. S. Patent No. 5,887,049).

With regard to claim 6, Fossum *et al.* disclosed the imaging system according to claim 3. However, Fossum *et al.* failed to teach that the imaging system further comprising a transmitter that transmits an x-ray beam that is received by the input device so that the electronic signal represents an x-ray image.

Fossum disclosed a CMOS active pixel sensor for x-ray imaging.

It would have been obvious to a person of ordinary skill in the art at the time the invention was made to modify the imaging system disclosed by Fossum *et al.* for x-ray imaging, since a person would be motivated to adapt a device for as many applications as possible to reduce the cost of research and development.

With regard to claim 7, Fossum *et al.* in combination with Fossum disclosed the imaging system according to claim 6, wherein the transmitter being synchronized to a switching of the control signals to the two-dimensional array of pixels (Fossum, column 3, lines 50-67).

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With regard to claim 14, claim 14 is rejected for the same reason set forth in the rejections of claims 6 and 7.

Allowable Subject Matter

20. Claims 9-11 would be allowable if rewritten to overcome the rejection(s) under 35 U.S.C. 112, second paragraph, set forth in this Office action and to include all of the limitations of the base claim and any intervening claims.

21. Claim 17 would be allowable if rewritten or amended to overcome the rejection(s) under 35 U.S.C. 112, second paragraph, set forth in this Office action.

22. The following is a statement of reasons for the indication of allowable subject matter:

With regard to claims 9 and 10, the prior art fails to teach or fairly suggest the imaging system further comprising a plurality of transmitters that are synchronized to a switching of the control signals to the two-dimensional array of pixels such that one attribute is stored in the first capacitor, and another attribute is stored in the second capacitor as claimed.

With regard to claim 11, the prior art fails to teach or fairly suggest that the imaging system further comprising a readout scheme which resets a voltage across the first and second capacitors to different values such that the sensor is sensitive to different attributes of the image due to a changed voltage across the sensor as claimed.

With regard to claim 17, the prior art fails to teach or fairly suggest that the electronic signal controlled by the controller so that the electronic signal is either added to the at least one capacitor when a phase of the first control signal is high and a phase of the second control signal

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is low, or the electronic signal is subtracted from the at least one capacitor when a phase of the first control signal is low and a phase of the second control signal is high as claimed.

Conclusion

23. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure:

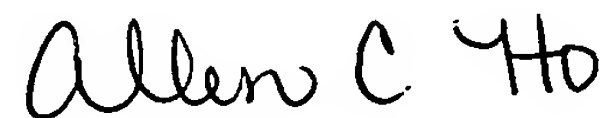
- (1) Böhm *et al.* (U. S. Patent No. 6,518,558 B1) disclosed a color image sensor comprising capacitors for storing color signals.
- (2) Kawahara *et al.* (U. S. Patent No. 6,429,413 B1) disclosed an image sensor having unit light receiving circuit with sample-and-hold means.
- (3) Beiley (U. S. Patent No. 6,317,154 B2) disclosed a method to reduce reset noise in photodiode based CMOS image sensors.
- (4) Caulfield *et al.* (U. S. Patent No. 6,040,568) disclosed a multipurpose readout integrated circuit with in cell adaptive non-uniformity correction.
- (5) Mallinson *et al.* (U. S. Patent No. 5,872,470) disclosed a pipelined sample and hold circuit with correlated double sampling.
- (6) Buhler *et al.* (U. S. Patent No. 5,742,047) disclosed a CMOS image photodiode sensor array with improved contrast ratio and dynamic range.
- (7) Takahashi (U. S. Patent No. 4,823,027) disclosed a sample and hold circuit.
- (8) Tew *et al.* (U. S. Patent No. 4,684,812) disclosed a switching circuit for a detector array.

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Any inquiry concerning this communication or earlier communications from the examiner should be directed to Allen C. Ho whose telephone number is (571) 272-2491. The examiner can normally be reached on Monday - Friday from 8:00 am - 5:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Edward J. Glick can be reached at (571) 272-2490. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Allen C. Ho
Patent Examiner
Art Unit 2882

ACH